

February 3, 2004

Show all work for credit.

1. Describe and sketch the surface:  $y^2 + 4z^2 = 4$

2. Find the limit:  $\lim_{t \rightarrow 0} \left\langle \frac{e^t - 1}{t}, \frac{\sqrt{1+t} - 1}{t}, \frac{3}{1+t} \right\rangle$

3. Sketch the curve of the vector equation. Indicate with an arrow the direction in which  $t$  increases.  
 $\mathbf{r}(t) = \langle \sin t, t, \cos t \rangle$